

AMENDMENTS TO THE DRAWINGS

The attached replacement sheet of drawings now designates Figures 1a, 1b, 2a, 2b and 2c as prior art.

REMARKS

Claims 1-65 were pending in the application. Claims 1-24, 29-32 and 49-65 are withdrawn from consideration. By this Amendment, claims 25, 28, and 43 are amended, claim 27 is cancelled, and claims 66 and 67 are added.

A. Objections to the Drawings

The Examiner objected to Figures 1a, 1b, 2a, 2b and 2c for not being designated by a legend such as --Prior Art--. A replacement sheet of drawings is attached which designates Figures 1a, 1b, 2a, 2b and 2c as prior art.

The Examiner has objected that the drawings do not show every feature of the invention specified in the claims. In particular, the Examiner objected that an upper cladding with an air clad portion as per claim 25 was not shown in the drawings. This issue has been addressed by an amendment to the claims, which now recite an upper cladding patterned to have at least one region in which a light transmissive element is air clad. Support for this amendment may be found, for example, in Figures 5b, 6b and 7b where it can be seen that the face of the lens is air-clad, i.e., simply in contact with air. Applicants submit that the replacement drawings and the amendment to the claims renders the drawings no longer objectionable.

B. Objections to the Specification

The abstraction of the disclosure is objected to because it exceeds 150 words. An amended Abstract is submitted herewith. Additionally, paragraph [0063] is amended to recite the US patent number rather than the US application number.

C. Claim Objections

Claim 25 is objected to because the claim includes the limitation that the upper cladding includes an air clad portion. Claim 25 is presently amended to recite "an upper cladding patterned to have at least one region in which the light transmissive element is air-clad."

D. Claim Rejections Under 35 U.S.C § 112

Claims 25 and 45 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 25 has been further amended to place the optional “lower cladding layer” into new dependent claim 66. As such, independent claim 25 as amended no longer recites an “optional lower cladding layer” though new dependent claims 66 and 67 include the “lower cladding layer.” Claim 45 has also been amended to remove the “where present” claim language. Applicants submit that these amendments also overcome the objection in respect of claim 45.

Reconsideration of claims 25 and 45 is respectfully requested.

E. Claim Rejections Under 35 U.S.C. § 102

Claims 25-28, 33, 34 and 41-43 are rejected under 35 U.S.C. § 102(b) as being anticipated by Sun et al. (US 5,432,877).

Claim 25 now includes the feature previously recited in claim 27, namely that the “light transmissive element” comprises “a waveguide and a lens as a unitary body.”

Claim 25 has also been amended to recite that the “lens has a face perpendicular to the substrate and focuses light in a plane parallel to the substrate.” Support for this feature can be found in the drawings and in the text. For example, this feature of the lens “face perpendicular to the substrate” can be seen in the drawing figures 3a, 3b, 5a, 5b, 6a, 6b, 7a and 7b. Those of ordinary skill in the art would also appreciate that the etching processes disclosed in the specification for patterning the light transmissive portions will produce structures which have perpendicular sides relative to the substrate on which they are deposited. The feature of “focus[ing] light in a plane parallel to the substrate” is disclosed, for example, at paragraph [0015] and is a result of the

perpendicular face of the lens relative to the substrate. Thus, applicants believe no new matter has been added.

The Examiner states that Sun teaches an integrated optical waveguide in figure 4D. The Examiner identified substrate 30, lower cladding layer 32, light transmissive element 34 and patterned upper cladding 36. The Examiner has identified the end portion 42 of light transmissive element 34 and the abstract as disclosing a lens unitary with the waveguide and having an air clad region.

The lens portion disclosed in Sun is prepared as stated at column 3, line 37 et seq. The end of the waveguide is etched to form a protrusion 42 extending from the end of the waveguide 40 having a gradually reduced cross-sectional area. This is accomplished in Sun by the use of HF solution. As stated at column 3, line 52-54, for rectangular waveguides the waveguide end may be shaped into a substantially pyramid shaped end after the waveguide 40 is etched. As stated, the shape of the protrusion 42 from the end of the waveguide 40 depends on the amount of time that the etching is allowed to take place, the shape of the core filled channel, and the dopants used. Once a pyramid shaped end has been achieved by HF etching, as stated in line 63, column 3, the protrusion is then heated to or above the glass softening temperature of the core material, resulting in surface tension in the core material functioning to shape the protrusion 42 into a substantially cone shaped lens having a smooth surface as shown in figure 4D.

The lenses produced in Sun are necessarily cone shaped as per column 3, line 69. As a result the Sun lenses are not capable of “focus[ing] light in plane parallel to the substrate” and do not have “a face perpendicular to the plane of the substrate”, as recited in amended claim 25.

Thus, the lenses in Sun are structurally and functionally distinct from independent claim 25. Sun does not disclose, teach or suggest the possibility of in plane focusing of light, and the advantages which flow from that in optical devices. Thermal softening as disclosed by Sun would be impracticable, if not impossible, as a way of providing in plane focusing of light, much else in

predetermined manner. Accordingly, applicants submit that the present application is not obvious in light of Sun.

At least for the reasons stated above for the allowability of independent claim 25, claims 26-28, 33, 34 and 41-43, which ultimately depend from claim 25, are also allowable. Reconsideration and allowance of claims 25-28, 33, 34 and 41-43 are respectfully requested.

F. Claim Rejections under 35 U.S.C. § 103

Claims 35-40 and 44-48 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Sun as applied to claims 25-28, 33, 34, and 41-43 above, and further in view of Ghoshal et al. Claims 35-40 and 44-48 are ultimately dependent on independent claim 25, which has been shown to be allowable. For at least the same reasons of allowability of claim 25, claims 35-40 and 44-48 are also allowable. Reconsideration and allowance of claims 35-40 and 44-48 are respectfully requested.

CONCLUSION

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to withdraw the outstanding rejection of the claims and to pass this application to issue. If it is determined that a telephone conference would expedite the prosecution of this application, the Examiner is invited to telephone the undersigned at the number given below.

In the event the U.S. Patent and Trademark office determines that an extension and/or other relief is required, applicant petitions for any required relief including extensions of time and authorizes the Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to **Deposit Account No. 03-1952** referencing docket no. **304122000600**. However, the Commissioner is not authorized to charge the cost of the issue fee to the Deposit Account.

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Respectfully submitted,

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